PATENT

#25

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of	)		
Applicant:	**ECCLES**, Anthony Philip)	Examiner:	John P. Sheehan
Serial No.:	08/637,802)	Art Unit:	1742
Filed:	May 8, 1996)		
For:	SILVER ALLOY COMPOSITIONS		
Attorney Docket No.:	4999		

DECLARATION UNDER RULE 132

Hon. Commissioner of Patents
and Trademarks
Box AF
Washington, D. C. 20231

Date: August 14, 2000

I, Melvin Bernhard, established United Precious Metal Refining Co. Inc. (United Precious Metal), on June 10, 1987, and incorporated United Precious Metal in 1988. I am the Vice President of United Precious Metal, and have been an officer, director, and in charge of Research and Development, since February 2, 1988. I am also an inventor for two U. S. Patents granted for silver copper alloys that have been assigned to United Precious Metal as discussed below.

United Precious Metal is the largest privately owned supplier of jewelry grade metal alloys in the United States. United Precious Metal manufactures 48 million dollars worth of metal alloys each year for the jewelry and material products market, and is an innovative developer of new metallic alloys. United Precious Metal has been assigned two U. S. Patents for silver alloy compositions, namely, U. S. Patent No. 4,973,446 to *Bernhard et al.* in 1990 and U. S. Patent No. 5,039,479 to *Bernhard et al.* in 1991.

I am familiar with the above-referenced patent application, as well as with the development, usage and properties of silver copper alloys for use in the manufacture of jewelry and other fine silver applications.

BACKGROUND INFORMATION

To the best of my recollection, sterling silver, near sterling silver, and other high silver concentration alloys have been commercially manufactured for the jewelry, house ware and minting industries for centuries, and have been available on a wide scale since at least the beginning of this century. Fire scale resistant sterling silver alloys first appeared in the industry in 1970. Many new compositions of these high silver content alloys have been manufactured over the years in order to fulfil particular needs. Minor variations in additives that chemically react with the high silver concentration alloys can have dramatic chemical and physical effects in the end product. Elements such as nickel, cadmium, zinc, and silicon have been used over the years as additives to silver rich silver copper alloys in order to improve the fire scale resistance of the alloys which will undergo heat treatment during post melt processes, as required during jewelry making, etc. Some of these additives are still used today.

United Precious Metal owns two U. S. patents as discussed above, which have advanced the company's manufacture and sale of its sterling silver alloy compositions. The '446 and "479 patents teach jewelry grade and other high silver content silver alloy compositions exhibiting superior fire scale resistance as is desirable for fine silver applications such as in the jewelry, house wares, flatware, and minting industries. The '446 and '479 *Bernhard* patents teach silver alloy compositions comprising, by weight, at least 89% silver, 0.01-2% silicon, 0.001-2% boron, 0.5-5% zinc, 0.5-6% copper, 0.25-6% tin and 0.01-1.25% indium. The silver alloy compositions of the '446 and '479 patents have had serious problems with their relatively soft consistency. The consistency of these alloys is too soft for practical jewelry making, seriously limiting the use of these alloys.

United Precious Metal, as early as September 1990, fully appreciated that it had an interest and desire to increase the hardness of its superior fire scale resistant sterling silver alloy, to a level akin to standard silver alloys used for jewelry making. Although United Precious Metal possessed the means and motivation to increase the work hardenability of its fire scale resistant silver alloys disclosed in the '446 and '479 patents, United Precious Metal was unable on their own, to find an acceptable way to increase the work hardenability of these fire scale resistant sterling silver alloys.

In early 1993, at a Santa Fe symposium, I attended a meeting with Anthony Philip Eccles of Apecs Investment Castings Pty. Ltd. (Apecs). I was familiar with Anthony Eccles' work in incorporating silicon additives into precious metals, and asked his assistance in reviewing the problems associated with increasing the work hardenability of our patented sterling silver alloys disclosed in the '446 and '479 patents.

Anthony Eccles developed a new silver alloy composition as disclosed in Claim 1 of the present patent application comprising, by weight, at least 86% silver, 05-5.5% copper,

0.07-6% mixture of zinc and silicon, wherein the silicon is present in a range of 0.2-2%, and 0.01-2.5% germanium.

Anthony Eccles had discovered that by adding trace amounts of germanium to the high-silver, low-copper, silver copper alloys of the '479 patent, the germanium, as it is believed, would remain in solid solution during post melt processing thereby increasing the work hardenability of the alloy over other fire scale resistant silver alloys. The trace amounts of germanium were also shown to increase the fluidity range of the alloy, allowing the alloy to stay liquid longer in order to fill any cracks forming in the solidifying silver, resulting in an alloy that solidified in a more uniform way when cast. This increased fluidity range also increased the alloys resistance to void formation in the resulting cast products because of the expanded solidification time, allowing the alloy to properly fill the entire mold. The sterling silver alloy as disclosed in Claim 1 of the present patent application had the properties sought after by United Precious Metal and was capable of passing rigorous acceptance tests, including tests for appearance, fire scale resistance, work hardenability, and usefulness and suitability for jewelry manufacturing.

United Precious Metal was delighted to be advised of the successful development of the sterling silver alloys of Claim 1 in the present application, and was sufficiently confident in these alloys, such that United Precious Metal entered into a license agreement with Apecs on July 15, 1994.

LICENSE AGREEMENT BETWEEN UNITED PRECIOUS METAL AND APECS INVESTMENT CASTINGS PTY. LTD.

United Precious Metal is currently an exclusive licensee of the above-referenced patent application that was assigned to Apecs. A copy of the license agreement is attached as Exhibit A. United Precious Metal is presently using the claimed invention to manufacture an "Apecs sterling silver alloy" composition comprising, by weight: 92.5% silver; 4.83% copper; 2.25% zinc; 0.2% silicon; 0.1% indium and 0.12% germanium, and an "Apecs master alloy" comprising, by weight, 64.4% copper, 30% zinc, 0.26% silicon, 0.13% indium and 0.16% germanium. United Precious Metal began selling the "Apecs sterling silver alloy" in 1995, the first full year of the license of the above patent application, and continues to manufacture and sell the alloy under the brand name "Sterling AG #57". The "Apecs sterling silver alloy" has enjoyed a wide degree of acceptability in the market place for its desirable silver color, overall appearance, fire scale resistance, sufficient work hardenability for practical jewelry making, and its expanded fluidity range, providing an alloy particularly desirable for the jewelry casting industry. The degree of acceptability of the "Apecs sterling silver alloy" is demonstrated by our customers willingness to purchase

this alloy in large quantities, at a price significantly greater than our other sterling silver alloys, as discussed below.

According to the terms of the license agreement, United Precious Metal has paid to Apecs a down payment of $9,000, and royalties of 10¢ per troy ounce of "Apecs sterling silver alloy" sold in 1995 to present, and 25¢ per troy ounce of "Apecs master alloy" sold in 1995 to present. Royalties were paid quarterly to Apecs according to a fiscal year of July 1 to June 30, and currently to date, United Precious Metal has paid Apecs $269,299.00 in royalties. United Precious Metal has paid fiscal yearly royalties to Apecs in the amount of $16,004.00 in 1995, $24,225.00 in 1996, $43,413.00 in 1997, $51,665.00 in 1998, $63,355.00 in 1999, $64,944.00 in 2000, and $5,691.00 so far in 2001, as seen in Exhibits B-F respectively. (Individual documentation for years 1995 & 1996 are not available)

United Precious Metal could cease any and all royalty payments to Apecs upon the abandonment for non-issuance of the present patent application, according to the terms in paragraph 4 of the license agreement, as seen in Exhibit A.

COMMERCIAL SUCCESS

Approximately 10 million troy ounces of sterling sliver alloy are sold in the United States every year, and the jewelry casting and material products industry represents about 25-30% of the entire sterling silver alloy market. United Precious Metal currently sells one million troy ounces of sterling silver alloys to the casting industry, capturing 1/3 of the total casting industry market.

The "Apecs sterling silver alloy" is our single biggest selling alloy, though not a majority of our business. We sell the "Apecs sterling silver alloy" exclusively to the jewelry casting and material products industry. This industry manufactures for example rings, pendants and products having a complex or three-dimensional shape. Casting of these products includes the process of filling molds with liquid sterling silver alloy to reveal the intricate and complex shapes and designs that make up each mold.

The "Apecs sterling silver alloy" has been responsible for increasing the sales of our sterling silver alloys by almost 250% since 1994. As can be seen in our Exhibits G & H, United Precious Metal sold about 400,000 troy ounces of sterling silver alloy in 1994, and only five years later, United Precious Metal sold nearly one million troy ounces of sterling silver alloy in 1999. The "Apecs sterling silver alloy" currently accounts for nearly 65% of United Precious Metal's total sterling silver alloy sales, accounting for sales of 636,521 troy ounces of "Apecs sterling silver alloy" in 1999. Further, United Precious Metal's annual sales of "Apecs sterling silver alloy" was 610,641 troy ounces in 1998, 495,837 troy ounces in 1997, 423,442 troy ounces in 1996, 242,250 troy ounces in 1995 and 160,043 troy ounces in 1994, as also shown in Exhibit G. In another perspective, United Precious Metal

has sold 5.77 million troy ounces of sterling silver since 1990. The "Apecs sterling silver alloy" comprises nearly half (2.63 million troy ounces) of all sterling sold by United Precious Metal since 1990, even though the "Apecs sterling silver alloy" has only been sold since 1994.

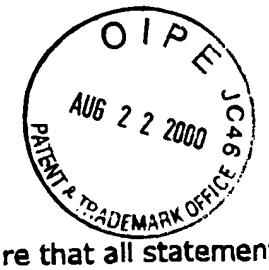
The "Apecs sterling silver alloy" became the preferred metal of choice of United Precious Metal customers, soon after its introduction to the market in late 1994. The "Apecs sterling silver alloy" is more expensive than our other sterling silver alloys, costing at least 25 cents more per troy ounce, yet still has remained our biggest selling alloy over the other sterling silver alloys sold by United Precious Metal. An increase of 25 cents per troy ounce is significant in the sterling silver alloy market because sterling silver alloy is seen as a commodity raw material, sold for $6.00 or less per troy ounce. An increase of only a few cents and ounce, could price a particular alloy right out of market. Customers have stated that characteristics such as superior fire scale resistance, increased work hardenability over other fire scale resistant silver alloys, as well as the lengthened fluidity range exhibited by the "Apecs sterling silver alloy", are reasons why they chose the more expensive "Apecs sterling silver alloy" over our other alloys. These characteristics were particularly sought after by manufactures of cast jewelry that contains intricate or complex shapes and designs.

I am familiar with the silver copper germanium alloys taught by Rateau et at. in GB 2,255,348. Rateau teaches only silver copper alloys incorporating large concentrations of germanium in order to achieve their desired results. It is well known that germanium is an expensive element. The amount of germanium needed to produce a viable commercial silver copper germanium product, according to the teaching of Rateau, would increase the cost of the product by 20-30% over traditional commercial silver copper alloys. In my opinion, bases on my 25 years experience selling and manufacturing silver copper alloys, this dramatic cost increase of the silver copper germanium alloys taught by Rateau, would negate any real commercial value of the alloy.

No increase in advertising was conducted for the "Apecs sterling silver alloy" over the other silver alloys sold by United Precious Metal. To the best of my knowledge, the "Apecs sterling silver alloy" was marketed in the normal way we introduce any new alloy, by advertising it only in our product brochures alongside our other high silver content silver copper alloys. For example, there was one color ad in a national magazine that ran periodically, advertising the "Apecs sterling silver alloy". We did the same advertising with our earlier sterling silver alloys.

In my opinion, bases on the information provided above, the commercial success of the "Apecs sterling silver alloy" is due to characteristics exhibited by the "Apecs sterling silver alloy" not duplicated by any other alloy known to me. The commercial success enjoyed by the "Apecs sterling silver alloy" is an indication and should have relevancy as

evidence, that the combination of elements in the "Apecs stellar silver alloy" composition claimed in the present application is non-obvious.



Melvin Bernhard

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 USC 1001, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Melvin Bernhard

SMK/pam